



State of Ohio Environmental Protection Agency

Southwest District Office

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George V. Voinovich, Governor
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October 6, 1997

RE: DOE FEMP
COMMENTS: REINJECTION
DEMONSTRATION TEST
PLANMr. Johnny Reising
U.S. Department of Energy, Fernald Area Office
P.O. Box 538705
Cincinnati, OH 45253-8705

Dear Mr. Reising:

This letter provides as an attachment Ohio EPA's comments on the draft "Re-Injection Demonstration Test Plan". This letter also serves as a written verification of our verbal approval to install the observation wells for this Test Plan. Our verbal approval was given during the weekly conference call on September 30, 1997.

If you have any questions please call Tom Ontko or me.
Sincerely,

for Thomas A. Schneider
Fernald Project Manager
Office of Federal Facilities Oversightcc: Jim Saric, U.S. EPA
Terry Hagen, FDF
Ruth Vandergrift, ODH
Dave Ward, HSI GeoTrans
Francie Barker, Tetra Tech EM Inc.
Manager, TPSS/DERR,CO

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Ohio EPA Comments on the Re-Injection Demonstration Test Plan

Specific comments

- 1) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #: 1.0 Introduction Pg. #: 1 Line # 26-29 Code: C
 Original Comment #
 Comment: The authors overstate maintaining high water levels due to re-injection. The text makes the statement that re-injection will minimize draw downs and keep water levels high. Based on Figure 1-4, overall groundwater levels will decline on the order of 4-6 feet, whereas, injection will locally raise groundwater levels (mounding) on the order of 2 feet.

 While it is true this will reduce residual contamination, the text neglects the fact that there will be an overall decline in water levels from prepumping to the post 1998 condition.
- 2) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #: 1.0 Introduction Pg. #: 1 Line # 18-21 Code: C
 Original Comment #
 Comment: The stated benefit of re-injection of minimizing pumping related drawdown at neighboring properties beyond the FEMP property is not addressed or mentioned again within the text of the plan. Further discussion within the plan should be provided and at a minimum include a description of the methods of monitoring, monitoring frequency, and reporting required to demonstrate that these pumping impacts have been minimized.
- 3) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #: 1.0 Introduction Pg. #: 1 Line # 18-30 Code: C
 Original Comment #
 Comment: The benefits listed for using re-injection neglects to include the accelerated cleanup concept contained in the BRSR (June, 1997) which describes strategies to improve the OU5 FS 20 to 30-year groundwater cleanup period to the new Ten Year Plan. The Ten Year Plan relies on the use of re-injection wells.
- 4) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #: 1.3 Decision Criteria Pg. #: 5 Line # 25-28 Code: C
 Original Comment #
 Comment: The text discusses injection and pumping rate adjustments that will be made to maintain the 20 ug/L total uranium plume capture; however, there is no description of the procedures and criteria for injection rate adjustment. Because these adjustments may be necessary for a viable system, they should be described in the plan.
- 5) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.

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Section #:1.4 Start-Up Sequence for the Demonstration Pg. # 8: Line # 2 Code: C
 Original Comment #

Comment: The text should describe specifically how flow rates and water levels are to be monitored.

- 6) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:1.0 Introduction Pg. # 12 Figure 1-2: Line # Code: C
 Original Comment #

Comment: The re-injection technology evaluation flowchart seems to infer that adjustments to the injection flow rate will require that injection be stopped prior to continuing the remediation. This may not be necessary in all circumstances.

- 7) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:1.0 Introduction Pg. # 12 Figure 1-2: Line # Code: M
 Original Comment #

Comment: Future groundwater modeling should be incorporated as a means of cross-checking the re-injection viability determined from the field results and for updating the conceptual model of the site. While discussion of groundwater modeling for planning purposes (i.e., BRSR) is presented, the plan should provide further discussion on how groundwater modeling will be used as an assessment tool.

- 8) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.0 Design Considerations Pg. # 28 Figure 2-3 Line # Code: C
 Original Comment #

Comment: The water elevation map for August 1996 demonstrates the hydraulic capture. Additionally, it would be helpful to provide a display of the drawdown. This would provide an areal display of where the GMA aquifer levels would decline and could also be used to compare with the model predictions (Figure 5-7, Baseline Remedial Strategy Report). Rather than select simply two monitoring periods, it is suggested that time-averaged water elevation data be used. Perhaps averaging values from 1994-1996 and subtracting this from water elevation data in the prepumping 1990-1993 period would provide a meaningful display of overall drawdown.

- 9) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.2 Aquifer Characteristics Pg. # 17 Line #18 Code: C
 Original Comment #

Comment: The text should describe what comprises the remaining 24 feet of overburden at 4398.

- 10) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.

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Section #:2.2 Aquifer Characteristics Pg. # 17 Line #18 Code: M

Original Comment #

Comment: The text states that groundwater flow is now more to the south due to pumping from the South Plume Module, however, a closer look at water levels in Figures 2-2 and 2-3 indicates that groundwater levels were contoured using different methods which may have mislead the author. The sharp bends in groundwater levels (e.g., the 518 ft level northeast of 2128) in Figure 2-2 suggest that water levels were developed using a computer-based contouring algorithm such as TIN. Figure 2-3, however, appears to be hand contoured. Groundwater contours in the south eastern portion of Figure 2-2 are likely computer generated extrapolations. It is this extrapolation when compared to the hand-drawn contours that gives the appearance of groundwater flow direction change. A number of figures in the March 1995 OU5 RI also appear to have been developed using computer generated contouring, e.g. Figures 3-50 and Figure 3-51. Development of a consistent and hydrogeologically correct methodology for constructing groundwater-level contour maps is critical to appropriately assessing the performance of the groundwater remediation. When comparing groundwater levels, a consistent groundwater-contouring interval should be applied, groundwater-contouring lines should be hydrogeologically viable, and groundwater-contour maps should show the location of major influencing factors such as the location of bedrock.

- 11) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:2.0 Design Considerations Pg. # 27-28 Figures 2-2 and 2-3 Code: C
Original Comment #
Comment: The figures should include a reference line showing the extent of groundwater monitoring per the DMEPP. Also a number of wells, e.g. 2391 appears on Figure 2-2, but not 2-3. To provide the best comparison of water levels, equivalent wells should be presented unless 2391 had not yet been installed in 1993.
- 12) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:2.2 Aquifer Characteristics Pg. # 18 Lines 28-30 Code: C
Original Comment #
Comment: There seems to be a logic flaw in the application of the designations for chemical mobility and persistence. Table 2-1 includes the designation of "MP" and "N" as developed in the OU5 FS. As stated in lines 30-32, page 18, these terms were based on constituent migration through the glacial overburden. These classifications seem to be inappropriately used in the re-injection plan. Although the complete monitoring strategy is not clearly discussed in this plan, the layout of the table implies that many of the constituents are not mobile "N" in discussing migration through the Great Miami Aquifer. The primary reason for constituents being designated as not mobile is the high sorptive capacity of the glacial overburden. The Great Miami Aquifer does not offer such high levels of sorptivity.

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- 13) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2 Aquifer Characteristics Pg. # 25 Table 2-1 Code: C
 Original Comment #
 Comment: The table does not include several radionuclides (Neptunium-237 and Radium-226) with groundwater concentrations > FRL in zones 2 and/or 4 (as per Table A-21, IEMP). Why?

- 14) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.3 Aquifer Remedy Pg. # 19 Line #20 Code: C
 Original Comment #
 Comment: Either the text should be changed by replacing "phases" with "modules" or Figure 1-3 should be modified to illustrate remediation implementation changes with time.

- 15) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.4 Industry Knowledge on the Design of Re-Injection Wells Pg. # 22 Line #14-15 Code: C
 Original Comment #
 Comment: It is not clear how the industry knowledge on the design of re-injection wells that "an effort should be made to maximize the length of the well screen," was used in selection of the actual re-injection well screen lengths.

- 16) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.5 Previous Site Experience Pg. # 23 Line #26 Code: C
 Original Comment #
 Comment: The statement is made that total iron concentration above 5 ppm results in precipitation of ferric iron in the Great Miami Aquifer. This seems to contradict the statement made on page 31 lines 12 and 13 that suggest a limit of 0.1 ppm total iron necessary to prevent the buildup of iron precipitate and bacteria in the wells. Please clarify these differences.

- 17) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:3.0 Demonstration Setup Pg. # 31 Line#18 Code: C
 Original Comment #
 Comment: The plan should further describe operationally when the flow rate will be controlled locally at each well head and when the flow rate will be controlled remotely from the AWWT Control Room.

- 18) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:3.1 General Design of the Re-Injection Wells Pg. # 33 Line#26 Code: C
 Original Comment #
 Comment: Restriction re-injection wells in areas where total iron concentration is below 5 ppm

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seems to contradict the statement made on page 31 lines 12 and 13 that suggest a limit of 0.1 ppm total iron necessary to prevent the buildup of iron precipitate and bacteria in the wells. Please clarify these differences.

- 19) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:3.1 General Design of the Re-Injection Wells Pg. # 33 Line#33 Code: C
Original Comment #
Comment: The source of the total uranium plume thickness and depth information used to size the re-injection well screens should be cited.
- 20) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:3.2 Installation of the Re-Injection Wells Pg. # 34 Line#12 Code: C
Original Comment #
Comment: The text "completed naturally" should be replaced by "with a natural filter pack."
- 21) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:3.3 Screen Location and Relations to the 20 ug/L Total Uranium Plume
Pg. # 36 Line# 1-7 Code: C
Original Comment #
Comment: The groundwater modeling results should not be the sole justification for assigning the depth of wells screens. As previously commented on in the Baseline Remedial Strategy Report, the model only approximates the actual heterogenous nature of the sand, gravels and clay which comprise the Great Miami Aquifer. Using particle tracking in such an averaged model can never fully account for the local variations which will govern plume movement. This is especially true for regions of re-injections. With planned the groundwater model revisions underway, it is not prudent to make such statement regarding model predictions.
- 22) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:3.4 Re-Injection Observation Wells Pg. # 37 Line#3-4 Code: C
Original Comment #
Comment: The text indicates that Well 22111 is located outside of the plume and that there is no need for deep monitoring at that location; however, Figure 4-1 shows Well 22111 within the 20 ug/L plume boundary. Please clarify.
- 23) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:3.0 Demonstration Setup Pg. # 39-41 Figures 3-2 to 3-4 Code: C
Original Comment #
Comment: All cross-sections presented should include the top of the bedrock surface and the depths of the proposed re-injection monitoring wells.

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- 24) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.0 Testing Program Pg. # 42 Line #28-32 Code: C
Original Comment #
Comment: The text describes integration of the collection of water levels collected in this plan with the IEMP Water Level Monitoring Program. Please compare this statement with statements in Section 1.6 Relationship to Other Documents, Page 9, Lines 25-29 and clarify.
- 25) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.2 Downhole Camera Surveys Pg. # 44 Line #8 Code: C
Original Comment #
Comment: What provisions will be made in case the well is too turbid to use a downhole camera? How long would re-injection be delayed to wait for borehole clarity?
- 26) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.3 Biological Sampling Pg. # 45 Line #27 Code: C
Original Comment #
Comment: The plan should outline the procedures for how the biological samples are to be taken, e.g., number of well volumes removed, etc. The plan should also specify if the biological sampling will be performed before, during, or after the groundwater quality sampling.
- 27) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.4 Groundwater Quality Sampling Pg. # 46 Line #31 Code: C
Original Comment #
Comment: To establish pre-injection conditions, the newly installed re-injection wells should also be sampled and analyzed prior to re-injection.
- 28) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.4 Groundwater Quality Sampling Pg. # 48 Line #10 Code: C
Original Comment #
Comment: It is very important to establish aquifer geochemistry at the FEMP site and in particular in the vicinity of the re-injection wells. It is not clear that the Geoprobe sampling tool will so greatly affect sample quality that all anions and cations should be dropped from the subsequent Geoprobe groundwater analyses. Field equipment blanks could be used to determine if iron from the Geoprobe tool are biasing results. Geoprobe samples should continue to include major anions and cations if at all possible.
- 29) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.4 Groundwater Quality Sampling Pg. # 48 Line #20 Code: C
Original Comment #

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Comment: The plan should specify how deep the Geoprobe samples will be taken.

- 30) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.4 Groundwater Quality Sampling Pg. # 48 Line #22 Code: C
Original Comment #
Comment: For clarity with the previous paragraph, "during the re-injection demonstration," should be moved to the front of the sentence. The paragraph should also describe if the geoprobe locations will be re-occupied during subsequent events.
- 31) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.4 Groundwater Quality Sampling Pg. # 48 Line #22 Code: C
Original Comment #
Comment: The plan should describe if the Hydrolab™ downhole water quality probes will be used to detect variations with depth or be held at one elevation within the wells.
- 32) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.5 Water Level Monitoring Pg. # 50 Line #26 Code: C
Original Comment #
Comment: The plan identifies that ultimately one reading will be eventually be taken every 1000 minutes. This frequency does not allow site workers to respond to a catastrophic buildup of water levels in the wells. Back pressure should also be discussed and monitored. Will the slow increase in measurement period lengths follow each scheduled and unscheduled injection well shutdown?
- 33) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.6 Water Level Monitoring Pg. # 51 Line #25 Code: C
Original Comment #
Comment: Does the colloidal boroscope provide three-dimensional groundwater flow directions?
- 34) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.6 Water Level Monitoring Pg. # 52 Line #1 Code: C
Original Comment #
Comment: The plan should clarify how the aquifer is stabilized, i.e., groundwater levels, etc.
- 35) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.6 Water Level Monitoring Pg. # 52 Line #6 Code: C
Original Comment #
Comment: The plan should specify when the colloidal boroscope measurements will be taken

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with respect to re-injection shutdown. Because many events will be completed on a quarterly basis a description of the relative schedule of each of these events should be provided.

- 36) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.6 Water Level Monitoring Pg. # 52 Line #34 Code: M
Original Comment #
Comment: The plan should provide a description of flow rate monitoring and reporting. The description should also provide how adjustments to flow rate will be achieved and recorded.
- 37) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.0 Testing Program Pg. # 56 Figure 4-1 Code: C
Original Comment #
Comment: The figure does not show the location of the deep observation well adjacent to Well 22107. The figure also shows Well 22111 inside of the 20 ug/L plume which contradicts a number of statements within the plan text. Please correct and clarify.
- 38) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:5.0 Data Evaluation Pg. # 60 Line #13 Code: C
Original Comment #
Comment: A bullet should be added which states, "Does reinjection cause the uranium plume to go deeper in the Great Miami Aquifer?"
- 39) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:5.0 Data Evaluation Pg. # 61 Line #11-13 Code: C
Original Comment #
Comment: The discussion regarding comparison of measured data and model results deserves substantially greater discussion. How will this be done? What types of data will be compared? What about resolutions of differences? Is this considered in the Baseline Remedial Strategy Report?
- 40) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:5.0 Data Evaluation Pg. # 60 Line # 18 Code: C
Original Comment #
Comment: The plan should identify what criteria are specified for determining if there are exceedances. The quality of the injectate is also monitored to determine if the water quality being injected could contribute to well plugging.
- 41) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:5.0 Data Evaluation Pg. # 60 Line # 22 Code: C

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Original Comment #

Comment: The text "camera survey" should be replaced by "downhole camera survey."

- 42) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:5.0 Data Evaluation Pg. # 61 Line # 28 Code: C
 Original Comment #
 Comment: Groundwater level data should be used in addition to the described methods to determine if a hydraulic barrier has been created at the southern boundary of the FEMP.
- 43) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:5.0 Data Evaluation Pg. # 63 Figure 5-1 Code: C
 Original Comment #
 Comment: In the center of the figure, a decision to stop re-injection due to plugging should specify "at a specific well or wells". There may be certain aspects, e.g. well diameter, that may suggest that plugging was unique to that particular well.
- 44) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:6.0 Schedules, Deliverables, and Reporting Pg. # 66 Table 6-1 Code: C
 Original Comment #
 Comment: The commitment for groundwater quality sampling and Geoprobe™ seems to have descriptions of Tables 4-1 and 4-2 reversed.
- 45) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:6.0 Schedules, Deliverables, and Reporting Pg. # 67 Table 6-1 Code: C
 Original Comment #
 Comment: The description of colloidal boroscope should specify "four deep wells" as specified in the text.
- 46) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:6.0 Schedules, Deliverables, and Reporting Pg. # 67 Table 6-1 Code: C
 Original Comment #
 Comment: The description of the commitment for system operation presented in Table 6-1 was not presented in the plan and should be further described.
- 47) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:7.0 Plugging and Abandonment of the Re-Injection Wells Pg. # 68 Code: C
 Original Comment #
 Comment: Will the re-injection wells be abandoned if the re-injection demonstration is unsuccessful?

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- 48) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:8.0 Management and Responsibilities Pg. # 69 Code: C
 Original Comment #
 Comment: The text "safe and prompt" should be replace with "safe, prompt, and correct"
- 49) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:8.0 Management and Responsibilities Pg. # 70 Code: C
 Original Comment #
 Comment: The responsibility for the groundwater monitoring team to calibrate field instruments should be included.
- 50) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:8.0 Management and Responsibilities Pg. # 70 Code: M
 Original Comment #
 Comment: Roles and responsibilities for operation of the re-injection system are not clear in Section 8.0. Information on water level data in re-injection wells is being collected by the groundwater monitoring team; however, it is not clear how this information will be relayed to the WWT operations team. It is also not clear who will be recording injection flow rates.

Editorial comments

- 51) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section # :1.0 Introduction Pg. #: 2 Line # 2 Code: E
 Original Comment #
 Comment: The period following Remediation Projects should be removed.
- 52) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section # :1.2 Re-injection Evaluation Strategy Pg. #:3 Line #5 Code: E
 Original Comment #
 Comment: Change "HSI-GeoTrans" to "HSI GeoTrans."
- 53) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:1.2 Re-injection Evaluation Strategy Pg. #:3 Line #11-13 Code: E
 Original Comment #
 Comment: Please reword sentence for greater clarity.
- 54) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:1.3 Decision Criteria Pg. #:5 Line #23 Code: E
 Original Comment #

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Comment: The words "in duration" should follow "shorter".

- 55) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:1.3 Decision Criteria Pg. #:5 Line #24 Code: E
 Original Comment #
 Comment: The words "the capture zone" should be replace with "the plume capture zone."
- 56) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:1.3 Decision Criteria Pg. #:5 Line #27 Code: E
 Original Comment #
 Comment: A comma should follow the word "plume."
- 57) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:1.3 Decision Criteria Pg. #:5 Line #33-34 Code: E, and;
 Section #:1.3 Decision Criteria Pg. #:6 Line #1-2 Code: E
 Original Comment #
 Comment: The creation of the hydraulic barrier at the southern FEMP property boundary by re-injection alone does not shorten the duration of the time to cleanup groundwater. This is accomplished by both extraction and re-injection which as the sentence describes "create hydraulic patterns and profiles within the aquifer that result in increased flushing and removal of the uranium plume. " For clarity "it helps to create a hydraulic barrier at the southern FEMP property boundary, and," , and "The hydraulic barrier is further explained in Section 1.4." should be removed. Additionally, "and removal" should follow "increased flushing."
- 58) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section # :1.4 Start-Up Sequence for the Demonstration. Pg. #: 7 Line # 12 Code: E
 Original Comment #
 Comment: The text "to determine that they have stabilized, " should be replaced by "to assess and verify that they have reached stabilization."
- 59) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section # :1.4 Start-Up Sequence for the Demonstration Pg. #:7 Line # 26 Code: E
 Original Comment #
 Comment: The text "and flow northward to create" should be replaced by "creating".
- 60) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:1.0 Introduction Pg. # 14 Figure 1-4: Line # Code: E
 Original Comment #

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Comment: For clarity, this figure should have different line symbols for the pre-pumping and post pumping water tables. In addition, an inverted triangle should be used to designate the surface of each of the water tables.

- 61) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.0 Design Considerations Pg. # 15 Line #25 Code: E
 Original Comment #
 Comment: Groundwater modeling results should be added to previous site experience.

- 62) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.1 Ohio EPA Re-Injection Guidelines Pg. # 16 Line #4 Code: E
 Original Comment #
 Comment: The text "sampling injectate strategy" should be replaced by "injectate sampling strategy."

- 63) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.1 Ohio EPA Re-Injection Guidelines Pg. # 16 Line #11 Code: E
 Original Comment #
 Comment: For consistency, the comma following "wells" should be removed.

- 64) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #: 2.2 Aquifer Characteristics Pg. # 17 Line #15 Code: E
 Original Comment #
 Comment: The term "anisotropic" should be replaced with "vertically and horizontally anisotropic."

- 65) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.5 Previous Site Experience Pg. # 22 Line #25 Code: E
 Original Comment #
 Comment: For clarification between "only" and "waters" the text should state which waters should be mixed, e.g., groundwater.

- 66) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section #:2.0 Design Considerations Pg. # 29 Figure 2-4 Code: E
 Original Comment #
 Comment: The shading of the bedrock should be changed to avoid confusion with the shading of the remediation modules.

- 67) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.

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Section #:3.0 Demonstration Setup Pg. # 31 Line#10 Code: E

Original Comment #

Comment: This sentence could read "During the demonstration, 1000 gpm of treated groundwater (injectate) from the AWWT Expansion Facility will be re-injected into the five re-injection wells at a rate of 200 gpm per well."

- 68) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:3.1 General Design of the Re-Injection Wells Pg. # 32 Line#22-25 Code: E
Original Comment #
Comment: The sentence within these lines is very long. Please reword for clarity.
- 69) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:3.1 General Design of the Re-Injection Wells Pg. # 33 Line#19-39 Code: E
Original Comment #
Comment: Because the re-injection wells have already been installed, verb tenses in this section should be in the past tense.
- 70) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.0 Testing Program Pg. # 42 Line #34 Code: E
Original Comment #
Comment: A "to" should be inserted between "used" and "document".
- 71) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.1 Analysis of Leachate Pg. # 43 Line #16 Code: E
Original Comment #
Comment: The text should replace "those" with "the".
- 72) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section #:4.1 Analysis of Leachate Pg. # 43 Line #18-19 Code: E
Original Comment #
Comment: MCLs, limits, and levels should all be plural.